

in LDD26W Shipley developer. SEM pictures of 150nm L/S patterns of developed silicon [containg] containing resist shown in Fig. 10[.](a). Boundary between imaging silicon resist and novolak underlayer is clearly visible. Note that there is a limited amount of residue "grass" present at silicon resist underlayer interface due to interfacial mixing during the processing. But residue is not significant and does not effect the imaging resist resolution (Fig. 10(a)). Fig.10(b) shows resist profiles on non tuned conventional Shipley novolac/diazonapthoquinone resist SPR 501 used as an underlayer. Although novolac/diazonapthoquinone resist SPR 501 was hard baked to [sutably] suitably cross-linked the material to prevent interfacial mixing with the resist, significant residue was observed. Resolution of 150nm and below can not be attained with conventional novolac/diazonapthoquinone resists.

REPLACEMENT PARAGRAPH:

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Specially tuned as described in examples 1- 4 Shipley grade 2 novolak resin had been spun coated onto 8" wafers then soft baked at 120C for 30 seconds and hard baked at 252C for 90 seconds using contact hotplates. A thin silicon containing resist described in example 4 is spun on a top of novolak underlayer and baked at 120C for 60 sec. Then resist is exposed to a 248nm radiation at a dose of about 38mJ/cm2 using ASML micostepper and post-exposed baked at 120C for 60 second. Then resist is developed in LDD26W Shipley developer. SEM pictures of 150nm L/S patterns of developed silicon containing resist shown in Fig. 10(a). Boundary between imaging silicon resist and novolak underlayer is clearly visible. Note that there is a limited amount of residue "grass" present at silicon resist underlayer interface due to interfacial mixing during the processing. But residue is not significant and does not effect the imaging resist resolution (Fig. 10(a)). Fig.10(b) shows resist profiles on non tuned conventional Shipley novolac/diazonapthoquinone resist SPR 501 used as an underlayer. Although novolac/diazonapthoquinone resist SPR 501 was hard baked to suitably cross-linked the material to prevent interfacial mixing with the resist, significant residue was observed. Resolution of 150nm and below can not be attained with conventional novolac/diazonapthoquinone resists.